FAA Telecommunications Infrastructure – (FTI) the Foundation for Surveillance Data Network (SDN)

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Agenda

- The Objective - Create and transition to an integrated wide area (national level) Surveillance Data Network that:
  - Saves Money
  - Improves Performance
  - Shares Multiple Data Sources
  - Facilitates Improved Data Management
- FTI provides the foundation to develop and sustain SDN which will provide multiple customers with a wide range of position services
- The FAA is now creating a Network that is the essential transmission backbone for SDN
- SDN Facilitates enhanced safety, efficiently and security


Improved Safety
Improved Capacity
Improved Security
Lower Costs
FUTURE AUTOMATION
DHS NEXT LEFT
DOD NEXT RIGHT
DHS
DOD
4-D Contract Negotiations
Dynamic Sectorization
Safety Alerts
Sensor Fusion
ADS-B
New Sensors
DAP
NoTAMS
Monitoring
Conformance
SDN
AUTOMATION MERGE AHEAD
FTI PAVEMENT

FTI Is Providing the Future Network for SDN

Build an IP Infrastructure in FTI

- High Availability – Low Latency
  - Flexible network management
  - Rapid reconfiguration based on situation
  - Self Healing Architecture
- Digital (S_xoIP) Implementation
  - Intelligently receive and interpret surveillance data and then recreate at the other end
  - Multicast
- Security (Assured Information Content)
- Standards based (vs. multiple proprietary vendor specific implementations)

Advantages of IP over Traditional Methods

Feature	Benefits
• Network Centric Architecture	• Facilitates System Wide Information Management
• All Digital Transmission	• Higher Data Integrity • Measurable QOS
• Flexible Addressing	• Reduces Hardware • Allows Dynamic Re-Allocation of Resources • Greater availability through diversity
• Bandwidth Efficient	• Reduced Costs

Types of Data Transported by FTI

- Radar
- Automatic Dependent Surveillance – Broadcast (ADS-B)
- Traffic Information Service – Broadcast (TIS-B) and/or some other form of the “Common Air Surveillance Picture” (CASP)
- Multilateration
- Weather
- Remote Maintenance and Monitoring (RMM)
- Remote Control Interface Unit (RCIU)
- Operational Support Services (OSS)
- Flight Data
- Security Monitoring Data
- Operational Voice

FTI Service Class Attributes

- Performance Requirements
  - RMA Category
  - Latency Level
  - Call Setup Time
  - Call Blocking Limit
  - Modem Compatibility
  - Voice Quality
  - Basic Security
- Performance Options
  - TSP
  - Enhanced and DS Security
  - Interface Type

- Security Requirements
  - BV1 – Basic Voice
  - BD1 – Basic Data
    - Authenticity and Integrity
  - EV1 – Enhanced Voice
    - Closed User Groups
  - ED2 – Confidentiality
  - ED3 – Intranet Services
  - ED4 – Extranet Services
  - ED5 – X.25 Closed User Groups
  - ED6 – Packet Filtering FW
  - ED7 – Bastion Host Firewall
  - DS – Dedicated Services

RMA Levels

- Service Availability
  - RMA1 - 0.9999971 – Restoration 6 Seconds – APS Required
  - RMA2 - 0.9999719 – Restoration 58 Seconds – APS Required
  - RMA3 - 0.9998478 – Restoration 8 Minutes – APS Required
  - RMA4 - 0.9979452 – Restoration 3 Hours
  - RMA5 - 0.9972603 – Restoration 4 Hours

Note - If approved by the FAA, full physical diversity and avoidance can be ordered for any service.

Operational Support Services

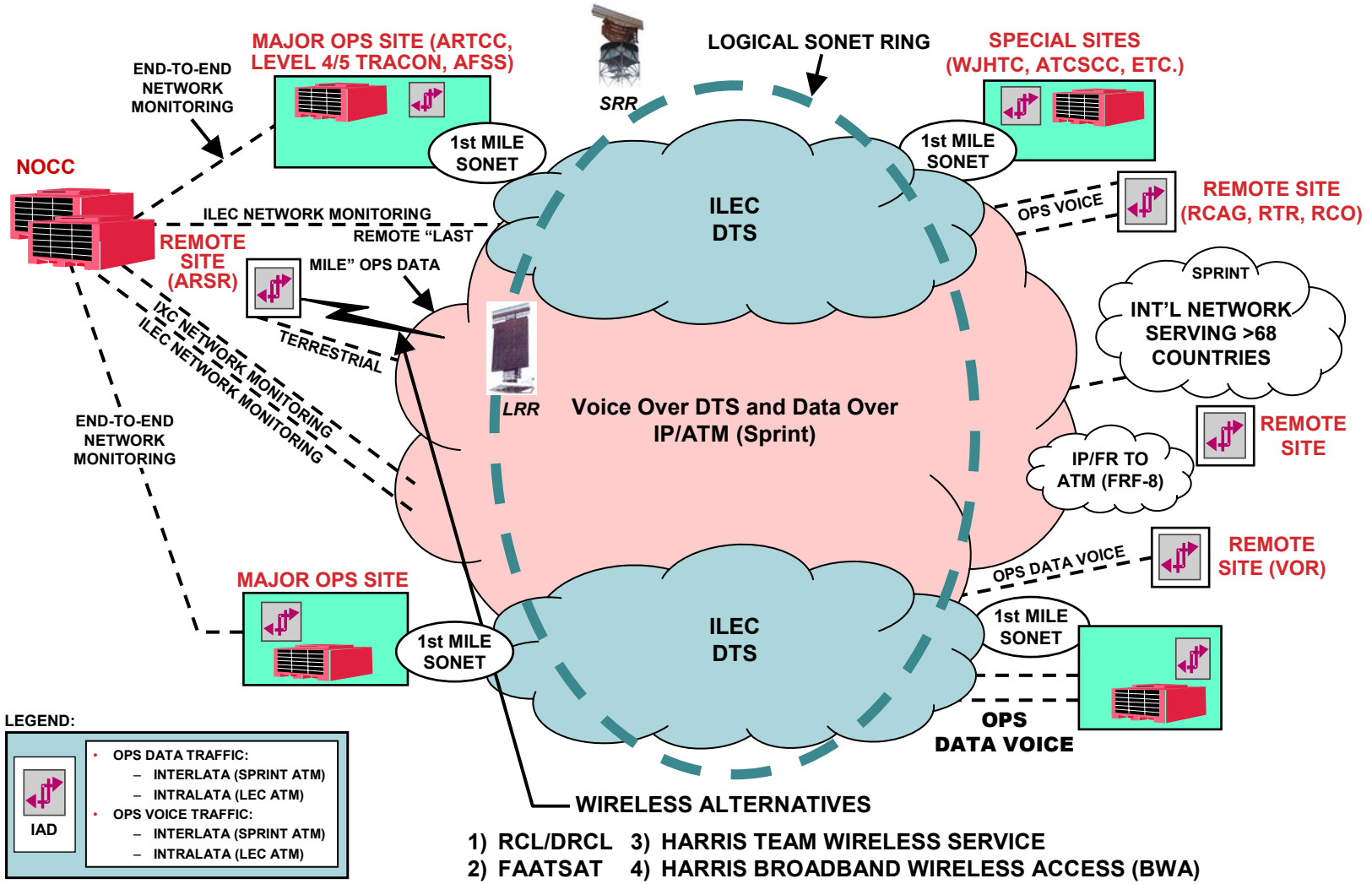
- NOCC – Network Operations Control Center
- SOCC – Security Operations Control Center
- IBS – Integrated Business Systems
- Help Desk
  - 24/7 Support
  - 800 Number
- Real time customer visibility for all the above systems

The FTI Schedule

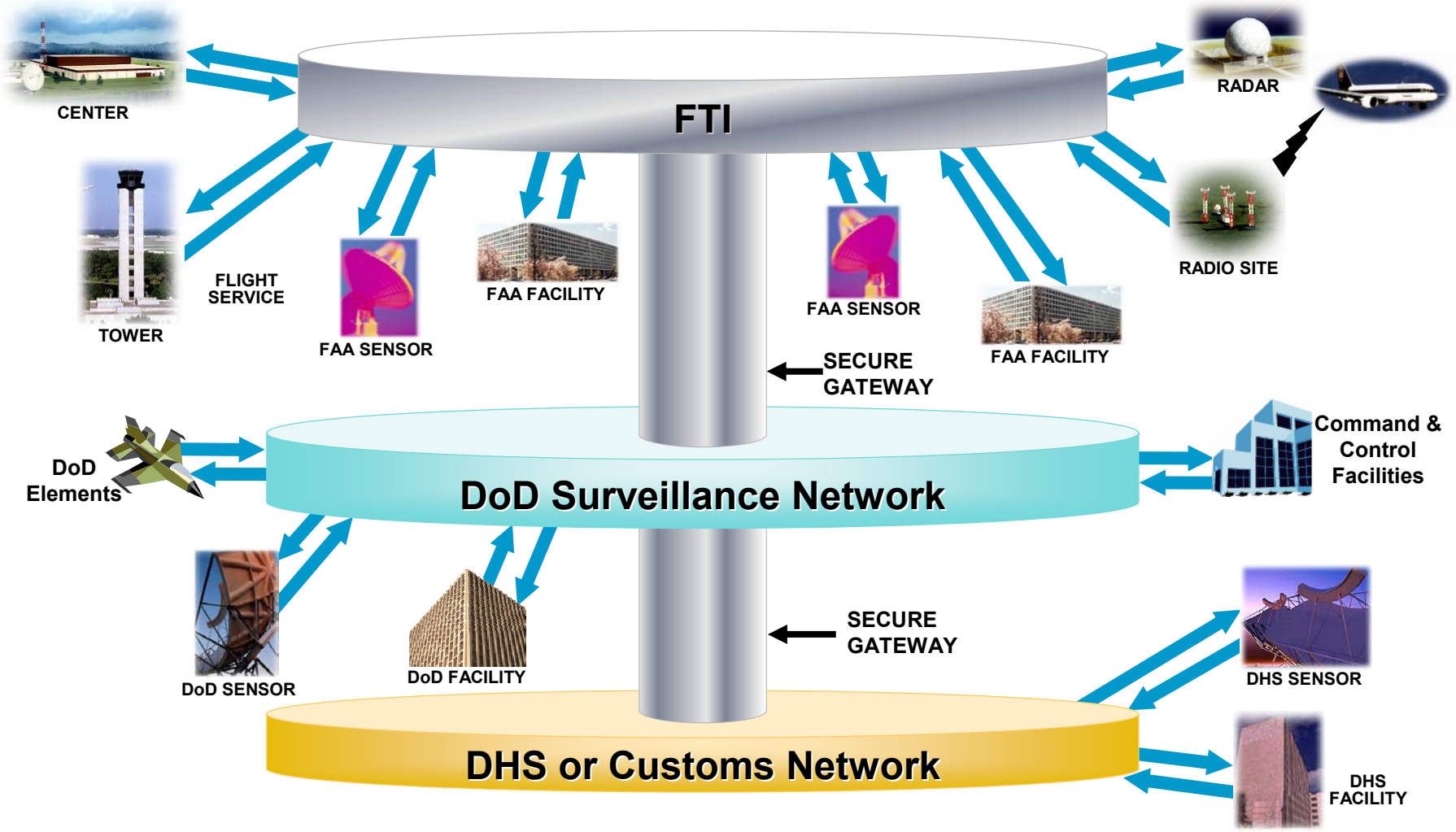
- Phase 1 - In Service Decision 23 Dec ’03
  - Phase 1 = National all digital FTI backbone
- Phase 2 Key Site (radar sites) tests June ’04
- Phase 2 In Service Decision July ’04
  - Small and remote facility connection to the network
- Radar site implementations GFY ‘05

FTI is Ready for Business!!

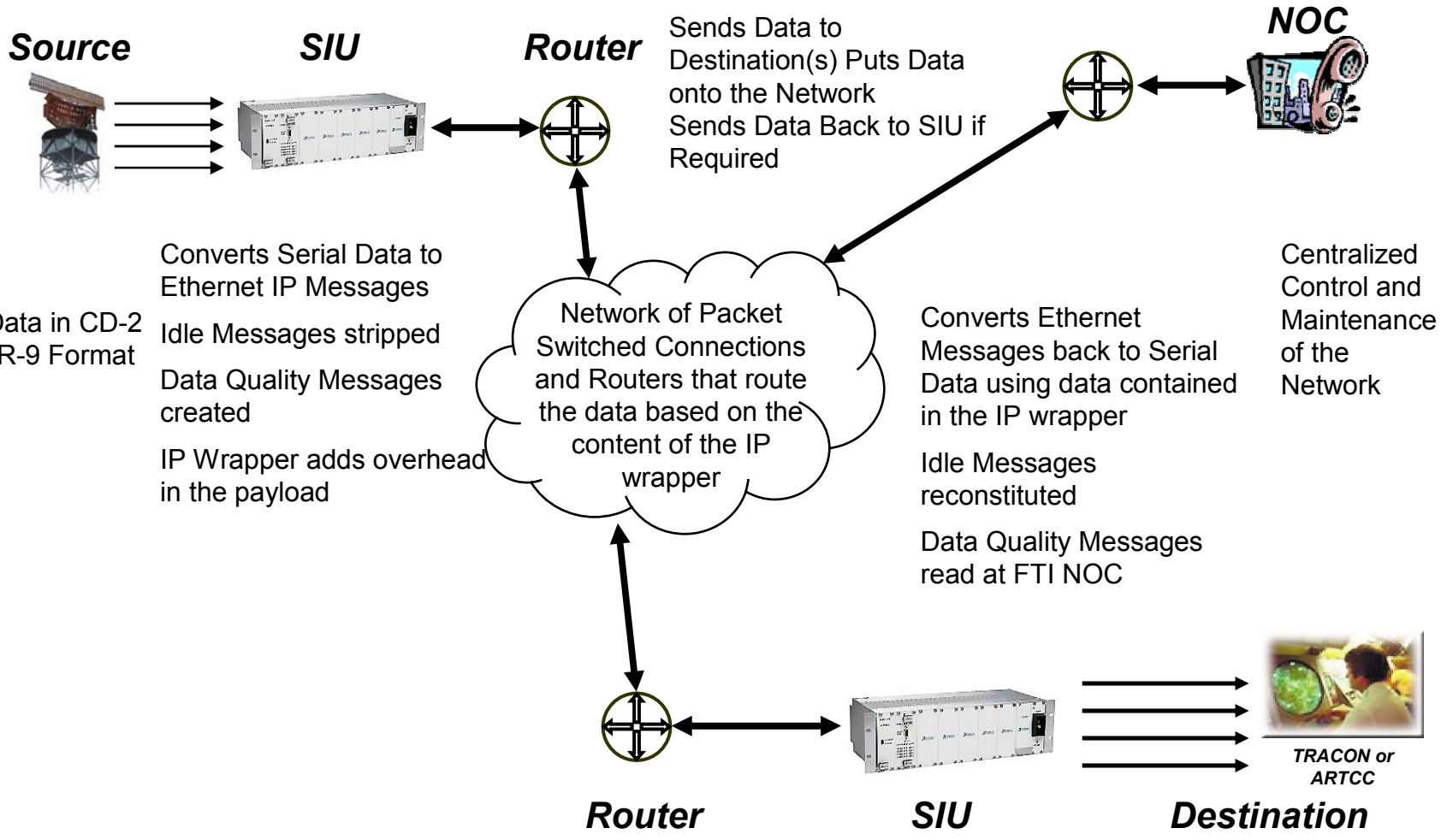
FTI Architecture



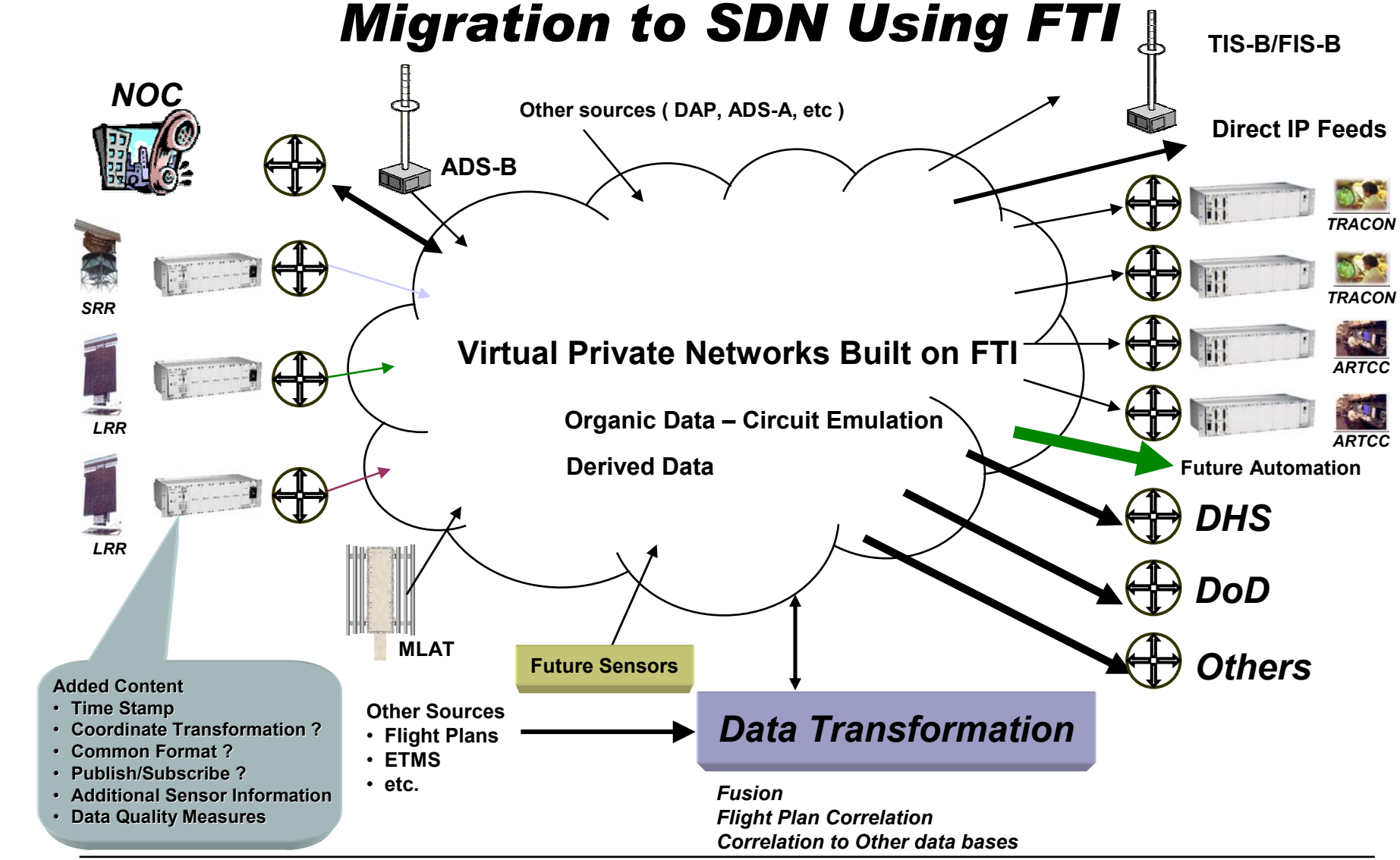
Multiple Networks Can be Integrated into SDN



Functional Description of the FTI Surveillance Service Implementation



Migration to SDN Using FTI

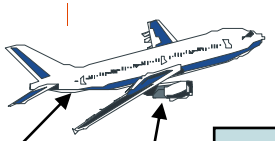


How SDN Supports the FAA Goals

- Safety
  - Facilitates a Common Air Picture
  - All users have all relevant knowledge readily available
  - Enhanced Safety Alerts
- Security
  - Inter-Agency Communications
  - Conformance Monitoring
- System Efficiency
  - ARTCC/TRACON/ATCT Consolidation
  - Reduced Surveillance Infrastructure and Costs
  - Flexibility, Scalability, Open Architecture
  - Decoupling Automation from Sensors
  - Dynamic Load Sharing
  - Dynamic Sectorization, SUAs, NOTAMS
  - Supports 4D Trajectory Negotiations
  - Supports DAP/Intent based separation

Automation (Enroute/Terminal) – 2015 Vision

Standard Automation Platform (SAP)
- Accepts SDN Positional Services
- Accepts SWIM Data
- Interfaces to Air/Ground Comms



Voice and data

Air/Ground Communications

Other ATC Facilities

ADS-B GBT

Multi-lat
Future Sensors
ATCBI-6
ARSR-4
ATCBI-6
ARSR-4
ATCBI-6

FTI
SWIM
SDN

Facility

Summary

- The FAA is now creating a Network that is the essential transmission backbone for SDN
- SDN will provide multiple customers with a wide range of position services to allow future automation systems
- Facilitates enhanced safety, efficiently and security